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(54) Title: METAL-CONTAINING NANOLAYERED COMPOSITES, AND APPLICATIONS THEREOF

(57) Abstract: Disclosed are peptide-metal composite materials that comprise small linear polypeptides at least some of which feature rare-earth metals coordinated to acids or bases in their side chains. The resulting composites crystallize in smectic-like arrays over length scales much longer than those of the molecular dimensions. The resulting crystals (1-2 mg) were insulating and transparent in the visible spectrum. The rare earths form quasi-two dimensional sheets with a separation distance determined by the linear dimension of the oligopeptide. The magnetization, M(B,T), was determined down to 2 K and in fields to 5.5 T using SQUID magnetometry. All samples were paramagnetic. Crystalline electric field modification of the magnetization was evident in isothermal M(B) for dysprosium (Dy)-based composites.